



## UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/840,558	04/23/2001	Robert L. Gerlach	F070	4812
25784	7590	11/07/2003	EXAMINER	
MICHAEL O. SCHEINBERG P.O. BOX 164140 AUSTIN, TX 78716-4140			GURZO, PAUL M	
			ART UNIT	PAPER NUMBER
			2881	

DATE MAILED: 11/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/840,558	GERLACH ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Paul Gurzo	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 August 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-7 and 22 is/are allowed.
- 6) ☒ Claim(s) 8-10, 14-21, 23-26 and 28-31 is/are rejected.
- 7) ☒ Claim(s) 11-13 and 27 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s): _____  |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)          | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8, 14, 20, 26, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. (6,414,323) further in view of Todokoro et al. (6,114,695).

Regarding claim 8, 323 teaches a scanning electron microscope comprising a primary beam column for forming a primary electron beam column including a high resolution objective lens (6) for forming a primary beam and scanning the beam across a specimen (8) to cause emission of secondary electrons including Auger electrons and a secondary electron optical system for collecting Auger electrons through the objective lens. It is obvious that since the secondary electrons are detected by a secondary electron detector (7) that is off the path of the primary beam that a deflection occurs (col. 3, lines 49-58 and Fig. 1). This detector is not explicitly an analyzer, however the specification lacks teaching as to how it's analyzer differs from the prior art's detector. In addition, the specification explicitly states that the ref. 38 is a detector or analyzer. Further, it is well known in the art of secondary electron detection that analyzing can occur. This is taught by 695 (col. 15, lines 49-60). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to analyze the electrons to lead to greater measurement precision.

Regarding claim 14, it is obvious that the prior art teaches the use of a snorkel lens because it achieves the same results as the prior art.

Regarding claims 20 and 29, 323 teaches a scanning electron microscope comprising a primary beam column for forming a primary electron beam column including a high resolution objective lens (6) for forming a primary beam and scanning the beam across a specimen (8) to cause emission of secondary electrons including Auger electrons and a secondary electron optical system for collecting Auger electrons through the objective lens. It is obvious that since the secondary electrons are detected by a secondary electron detector (7) that is off the path of the primary beam that a deflection occurs (col. 3, lines 49-58 and Fig. 1). Fig. 1 also depicts the claimed location of the deflectors. This detector is not explicitly an analyzer, however the specification lacks teaching as to how it's analyzer differs from the prior art's detector. In addition, the specification explicitly states that the ref. 38 is a detector or analyzer. Further, it is well known in the art of secondary electron detection that analyzing can occur. This is taught by 695 (col. 15, lines 49-60). 695 also teaches a high resolution SEM, and this resolution is obviously falls within the resolution value.

Regarding claim 26, the prior art teaches the method of performing Auger electron spectroscopy using a high resolution scanning electron microscope comprising directing a beam of primary electrons through an objective lens to a specimen, collecting Auger electrons through the objective lens, and analyzing the electrons as stated above. Further, 695 teaches the formation of an image based on the secondary electrons (col. 15, lines 49-60), and this image formation is located off the path of the primary beam.

Claims 9,10, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. (6,414,323), in view of Todokoro et al. (6,114,695), and further in view of Schmitt et al. (5,847,399).

Regarding claims 9,10, and 26, the above-applied prior art does not explicitly teach the use of a shield. However, 399 teaches the use of an objective lens (5) as well as a shield (61) that shields the primary beam from the field and is conductive on the inside and resistive on the outside (col. 3, line 34 - col. 4, line 9 and Fig. 1 and 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a shield with desired qualities because this will prevent destructive current and field effects.

Claims 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. (6,414,323), in view of Todokoro et al. (6,114,695), and further in view of Todokoro et al. (6,310,341).

Regarding claims 15-18, the above-applied prior art does not teach the use of dual pole magnetic lens. However, Todokoro et al. teach the use of a first and second magnetic pole lens (401 and 402) that is disposed within the lens assembly (col. 7, lines 14-61 and Fig. 4). These poles have an aperture for passing the primary electron beam and they make use of a deflection plate to selectively apply potential. Any modification, such as the addition of coils and movable attachments, is considered obvious to the above teachings and is not given patentable weight. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use these magnetic poles so that the electron beam path can be adjusted for higher electron transmission.

Regarding claim 19, Todokoro et al. teach movement of the sample in the x- and y- directions (col. 1, lines 63-64), and it is known in the art of sample implantation that the sample can be moved in both the horizontal and vertical directions.

Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. (6,414,323), in view of Todokoro et al. (6,114,695), and further in view of El Gomati et al. (6,570,163).

Regarding claim 23, 323 teaches a scanning electron microscope comprising a primary beam column for forming a primary electron beam column including a high resolution objective lens (6) for forming a primary beam and scanning the beam across a specimen (8) to cause emission of secondary electrons including Auger electrons and a secondary electron optical system for collecting Auger electrons through the objective lens. It is obvious that since the secondary electrons are detected by a secondary electron detector (7) that is off the path of the primary beam that a deflection occurs (col. 3, lines 49-58 and Fig. 1). This detector is not explicitly an analyzer, however the specification lacks teaching as to how it's analyzer differs from the prior art's detector. In addition, the specification explicitly states that the ref. 38 is a detector or analyzer. Further, it is well known in the art of secondary electron detection that analyzing can occur. This is taught by 695 (col. 15, lines 49-60). The above-applied prior art does not explicitly teach a magnetic field. However, it is well known in the art that lenses cause a magnetic field as taught by 163 (col. 1, lines 25-32). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a magnetic field because this will ensure spatial dispersion of the electron trajectories according to their energy so that a narrow energy window can be filtered.

Regarding claim 24, 414 teaches an applied voltage to deflect secondary electrons having certain energies (col. 5, lines 43-46).

Claims 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. (6,414,323), in view of Todokoro et al. (6,114,695), in view of El Gomati et al. (6,570,163), and further in view of Schmitt et al. (5,847,399).

The above-applied prior art does not explicitly teach the use of a shield. However, 399 teaches the use of an objective lens (5) as well as a shield (61) that shields the primary beam from the field and is conductive on the inside and resistive on the outside (col. 3, line 34 - col. 4, line 9 and Fig. 1 and 2). This teaches on the use of an inner and outer surface that is resistive and charged. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a shield with desired qualities because this will prevent destructive current and field effects.

Claims 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. (6,414,323), in view of Todokoro et al. (6,114,695), and further in view of Gerlach (4,806,754).

Regarding claims 30 and 31, the above-applied prior art does not teach the use of a spherical capacitor, but 754 demonstrates the use of one as an energy analyzer for charged particle (col. 2, lines 41-42). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use this capacitor because it is well known in the art and achieves the claimed results.

#### ***Allowable Subject Matter***

Claims 1-7 and 22 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

With respect to the independent claim 1, as claimed invention was read in light of the specification, the prior art of record fails to teach the claimed use of an electrostatic capacitor as well as a shield that is conductive on the inside to shield the primary beam and having a potential gradient on the outside to create an external field related to the electric field of the electrostatic capacitor to reduce distortion of the field of the capacitor caused by the shield. With respect to the independent claim 22, as claimed invention was read in light of the specification, the prior art of record fails to teach the collection efficiency being greater than twenty percent for Auger electrons having an energy of 100 eV.

Claims 11-13, and 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Gurzo whose telephone number is (703) 306-0532. The examiner can normally be reached on M-Thurs. 7:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Lee can be reached on (703) 308-4116. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.




Application/Control Number: 09/840,558

Page 8

Art Unit: 2881

PMG

October 17, 2003

  
JOHN R. LEE  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY